

CLAIMS

What is claimed is:

1. A method for coordinating services in an integrated wireless local area network and a cellular network system, the method comprising the steps of:

classifying types of wireless transmit and receive units (WTRUs) accessing the system according to the ability of the WTRUs to simultaneously access wireless local area networks and cellular networks;

identifying the level of integration between the wireless local area network and the cellular network;

transmitting an alert of an incoming mobile terminated session to the WTRU based on the type of WTRU and the level of integration; and

routing user traffic to the WTRU based on the type of WTRU and the level of integration.

2. The method of claim 1 wherein:

the type of WTRU includes units capable of operating in a wireless local area network-active mode and cellular-active mode, whereby said units have a capability of simultaneously sending and receiving data on both wireless local area network and cellular radio channels;

the type of WTRU includes units capable of operating simultaneously in a wireless local area network-idle mode and cellular-idle mode, whereby said units have a capability of either wireless local area network-active mode or cellular-active mode, but not both simultaneously, said units capable of sending and receiving signaling and control messages simultaneously from both wireless local area networks and cellular networks, but capable of only sending and receiving user traffic data on one of a wireless local area network radio channel and a cellular radio channel; and

the type of WTRU includes units capable of operating either in the wireless local area network mode or cellular mode, but not both simultaneously during both idle and active modes.

3. The method of claim 1, further comprising providing classifications of said level of integration, whereby Level-0 integration provides no connection between the wireless local area network and the cellular network for exchanging predetermined signaling and control information and no connection for exchanging user traffic data, Level-1 integration provides a connection between the wireless local area network and cellular network for exchanging the predetermined user signaling and control information and no connection for exchanging user traffic data, and Level-2 integration provides a connection between the wireless local area network and the cellular network for exchanging predetermined signaling and control information and also a connection for exchanging user traffic data.

4. The method of claim 3, wherein the predetermined signaling and control information includes call or session set-up related signaling and control information.

5. The method of claim 1, wherein:

if the type of the WTRU and the level of integration are such that the WTRU cannot receive information from at least one of the cellular network and the wireless local area network, one of the cellular network and the wireless local area network provides alerting information to the WTRU through the other of the cellular network and the wireless local area network according to availability of communications with the WTRU; and

if the type of the WTRU and the level of integration are such that the WTRU receives information from both the cellular network and the wireless local area network, one of the cellular network and the wireless local area network provides

alerting information to the WTRU.

6. The method of claim 1, wherein:

if the type of the WTRU and the level of integration are such that the WTRU cannot receive information from at least one of the cellular network and the wireless local area network, one of the cellular network and the wireless local area network provides alerting information to the WTRU through the other of the cellular network and the wireless local area network according to availability of communications with the WTRU;

if the type of the WTRU and the level of integration are such that the WTRU receives information from both the cellular network and the wireless local area network, the cellular network provides alerting information concerning communications from the cellular network to the WTRU; and

if the type of the WTRU and the level of integration are such that the WTRU receives information from both the cellular network and the wireless local area network, the wireless local area network provides alerting information concerning communications from the wireless local area network to the WTRU.

7. The method of claim 1, further comprising, subsequent to receiving an alert, changing connection status according to a predetermined criteria, the predetermined criteria including quality of service.

8. A method for coordinating services in integrated wireless local area network and cellular network systems, the method comprising the steps of:

classifying types of wireless transmit and receive units (WTRUs) accessing the system according to the ability of the WTRU to simultaneously access wireless local area networks and cellular networks;

identifying the level of integration between the wireless local area network and

the cellular network;

in the case of the WTRU providing simultaneous local area network services and cellular network services, transmitting an alert of an incoming mobile terminated session to the WTRU for shared services; and

in the case of the WTRU providing local area network services and cellular network services without simultaneous functions, transmitting an alert of an incoming mobile terminated session to the WTRU for non-shared services; and

routing user traffic to the WTRU based on the type of WTRU and the level of integration.

9. The method of claim 8, further comprising, in the case of the WTRU providing simultaneous local area network services and cellular network services when in an idle mode classifying the WTRU in accordance with an ability to operate simultaneously in the inactive mode, but in an active state of the WTRU, transmitting an alert of an incoming mobile terminated session to the WTRU for non-shared services.

10. The method of claim 9, wherein the transmitting an alert of an incoming mobile terminated session to the WTRU includes transmission of the alert for alerting the WTRU for indicating an incoming session and transmitting the alert for establishing sessions with the WTRU.

11. A network providing cellular telecommunications services having integrated wireless local area network and cellular network systems, the network comprising:

a configuration for classifying types of wireless transmit and receive units (WTRUs) accessing the system according to the ability of the WTRU to simultaneously access wireless local area networks and cellular networks;

a configuration for identifying the level of integration between the wireless local area network and the cellular network;

a configuration for transmitting an alert of an incoming mobile terminated session to the WTRU based on the type of WTRU and the level of integration; and

a configuration for routing user traffic to the WTRU based on the type of WTRU and the level of integration.

12. The network of claim 11, wherein:

if the network provides a connection between the wireless local area network and cellular network for exchanging the predetermined user signaling and control information and no connection for exchanging user traffic data, the network provides alert information received from the wireless local network to WTRUs communicating with the cellular network system, and if the WTRU has a capability of directly receiving alert data, the network generating the alert data provides the alert data to the WTRU.

13. A method for coordinating services in integrated wireless local area network and cellular network systems, the method comprising the steps of:

classifying types of user equipment accessing the system according to the ability of the equipment to simultaneously access wireless local area networks and cellular networks;

identifying the level of integration between the wireless local area network and the cellular network;

transmitting an alert of an incoming mobile terminated session to the user equipment based on the type of user equipment and the level of integration; and

routing user traffic to the user equipment based on the type of user equipment and the level of integration.

14. A wireless communication system comprising:
 - a wireless local area network and a cellular network, the wireless local area network and the cellular network having at least one overlapping geographic coverage area;
 - at least one user equipment located within the geographic coverage area;
 - a signaling connection between the wireless local area network and the cellular network; and
 - a user traffic connection between the wireless local area network and the cellular network.

15. The system of claim 14 wherein the wireless local area network notifies the user equipment of an incoming wireless local area network transmission when the user equipment is idle with respect to the wireless local area network and active with respect to the cellular network by sending a message through the cellular network to the user equipment.

16. The system of claim 15 wherein the incoming transmission is transmitted through the cellular network to the user equipment.

17. The system of claim 15 wherein the user equipment is activated with respect to the wireless local area network and the incoming transmission is transmitted through the wireless local area network to the user equipment.

18. The system of claim 15 wherein the user equipment is off with respect to the wireless local area network.

19. The system of claim 14 wherein the cellular network notifies the user equipment of an incoming cellular network transmission when the user equipment is

idle with respect to the cellular network and active with respect to the wireless local area network by sending a message through the wireless local area network.

20. The system of claim 19 wherein the incoming transmission is transmitted through the wireless local area network to the user equipment.

21. The system of claim 19 wherein the user equipment is activated with respect to the cellular network and the incoming transmission is transmitted through the cellular network to the user equipment.

22. The system of claim 19 wherein the user equipment is off with respect to the cellular network.